

*The Smith
Huyett & Manufacturing
Company*

*Detroit, Mich.
U. S. A.*

*SECTIONAL CATALOGUE,
DRYING,
HEATING & VENTILATING
APPARATUS.*

TD CAT 1980 Huyett & Smith

ATHENAEUM OF PHILADELPHIA

No. 2.

SECTIONAL CATALOGUE

RELATING TO

STEAM HOT BLAST APPARATUS

FOR

DRYING LUMBER, BRICK AND OTHER MATERIAL,

AND

HEATING AND VENTILATING BUILDINGS,

ISSUED BY THE

HUYETT & SMITH MFG. CO.

1400 RUSSELL STREET,

DETROIT, MICH., U. S. A.

NEW YORK OFFICE, 107 LIBERTY STREET,

CHICAGO BRANCH, No. 31 SOUTH CANAL STREET.



INTRODUCTION.

THE PURPOSES OF THIS BOOK are to bring before the public in convenient form, a branch of our business, which is daily increasing, and which is becoming more and more an important factor in the erection of all public buildings, factories, warehouses, etc.

Much has been written on the subject of HEATING AND VENTILATION and it is not our intention to enlarge on this subject in these pages further than to point out wherein our Apparatus is especially adapted to this kind of work and to show the many features, which we consider improvements over any other Apparatus made.

We plan and contract for Heating and Ventilating Plants of all descriptions, furnishing everything (when required) from Boilers to the least fixture necessary to complete the entire plant ready for operation.

For advice regarding the proper application of our Apparatus we make no charge, as it is our desire that customers be fully informed.

Fully as important and extensive an application of the use of our Apparatus as for Heating and Ventilating is in its use for DRYING LUMBER, LATHS, SHINGLES, STAVES, HEADING, CARRIAGE STOCK, BRICK, POTTERY, LEATHER, COTTON, MOSS, JUTE, HEMP, SEEDS, SALT, SUGAR, FRUIT, WOOL, TOBACCO, GLUE, CHALK, SOAP, HAIR, FISH, GRAIN, PEPSIN, TEXTILE FABRICS, EXCELSIOR, and in fact all substances from which moisture is to be removed.

Drying is erroneously supposed by many to be a difficult matter, more because they do not understand the simple laws by which it is accomplished, than from lack of experience. Air serves very much the same purpose as a sponge in taking up or absorbing moisture, its ability to absorb moisture depending largely upon its temperature. The lower the temperature of air above freezing point, the more vapor or water it contains; the higher the temperature the less vapor it contains, thus increasing its absorbing qualities. It is often supposed by many, that an intense heat is all that is required. Such is not the case as more material can be thoroughly dried by a rapid movement of cold air than can be dried by a very high temperature with no circulation; but, by raising the temperature of the air we increase its effectiveness and this is wherein lies the secret of the successful operation of our Hot Blast Drying Apparatus.

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Different materials require different temperatures, as for instance, glue and sugar. Glue has to be dried with a very low temperature while sugar requires a very high temperature. Oak lumber, if subjected to a high temperature, will check so badly as to become almost valueless, while pine is not so sensitive, because of the difference in the density of the woods.

Our experience extends over a course of many years, we being pioneers in Hot Blast Heating and Drying, during which time we have been alive to any improvements that might suggest themselves, which would enhance the value of our machines.

This system of Heating and Drying has secured the endorsement of all Insurance Companies and authorities generally and all parties interested in this direction will find the following pages worth their careful consideration.

HUYETT & SMITH MFG. Co.

Patentees and Sole Manufacturers,

DETROIT, MICH.



DESCRIPTION.

THE SMITH HOT BLAST APPARATUS.

THE APPARATUS consists of a Fan and coils of Steam Pipe placed on one base or platform, the coils being enclosed in a sheet steel jacket with wrought angle-iron frames. The Fan is supported by our improved cast-iron base, which provides an outside bearing for pulley on Fan Shaft, or serves as a base for Engine when attached direct to shaft. The Fan is connected to heater case and all put together with bolts so they can be easily taken apart or removed, should necessity require it. The apparatus is supplied with straight-way

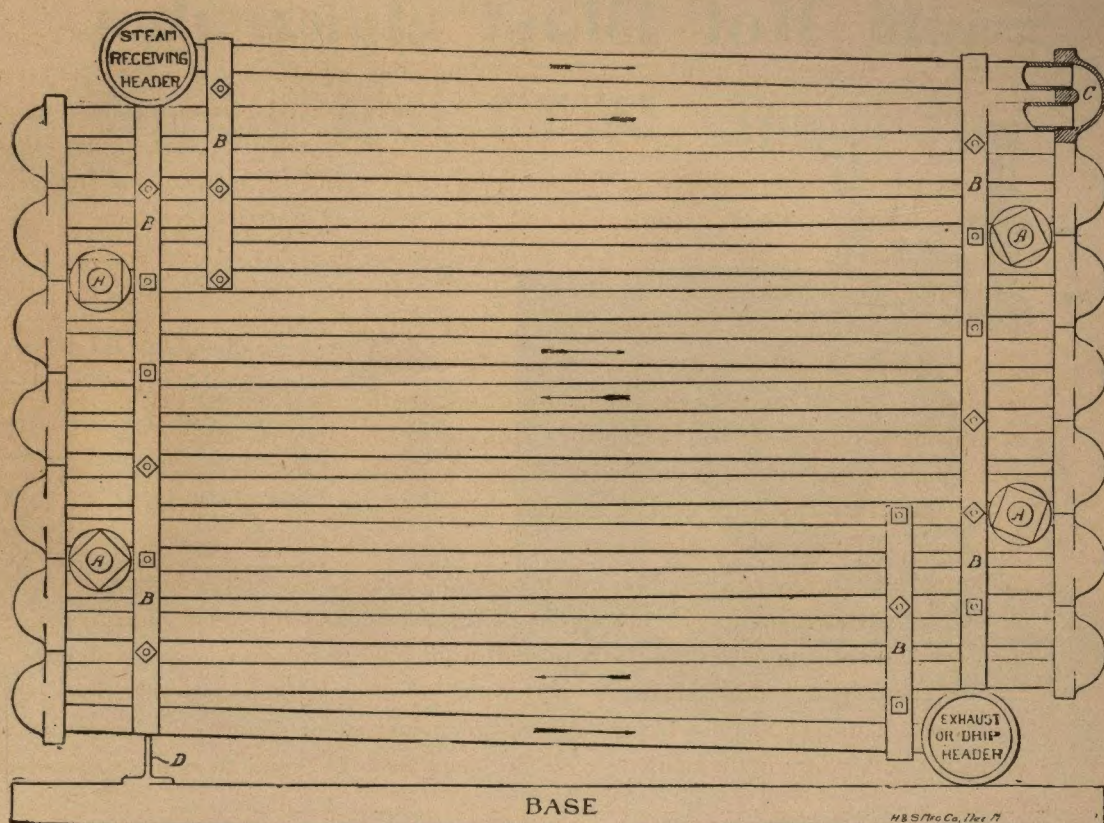
gate valves, for both live and exhaust steam, drip valves, and best patent oilers on fan bearings. These apparatus (except the very large ones) are shipped set up complete, with all connections made ready for running into position and operation, as soon as belt or steam is put on.

The Fan attached to our Heater is what is known as the Smith Disc Fan Blower, the shell and fan blades being constructed of the best homogeneous sheet steel, steel shaft of large diameter, and long, perfectly adjustable bearings, lined with the best anti-friction metal. The wheel of this Fan is of the lightest as well as the strongest possible construction, which insures the MOST EFFICIENCY for the LEAST AMOUNT OF POWER required to operate it, and it is also the only style of Fan which is ESPECIALLY ADAPTED for use in connection with Hot Blast Apparatus, where only a moderate velocity with great volume of air blast is required, which is invariably the requirements in heating, ventilating, or drying. We manufacture every style of Fan or Blower made, and after repeated competitive trials of the various styles and kinds of Fans and Blowers, we have found that our Smith Disc Fan Blower will deliver fully 50 per cent. more air for the same amount of power required to operate than any other style of fan or blower made, and the use of this Fan in connection with our Heaters is one of the patented features of our apparatus.

Our Heaters are made of the heaviest steel or wrought-iron pipe, and all the headers, return bends, nipples and fittings throughout, are of our own manufacture, extra heavy, and of the best possible material and design for the requirements. We make these Heaters in one, two, three, or four sections, as may be desired for using either live or exhaust steam, separately or combined, and every Heater is tested in our factory after completion, to 200 lbs. hydraulic pressure, which is equivalent to 230 lbs. steam pressure. Our sectional Heaters are cross connected between sections, so that ANY SECTION can be used for either live or exhaust steam, or changed from one to the other at will. The Heater coils are so arranged that any one coil or row of pipe can be removed or repaired without disturbing the balance of the Heater; in fact, no other heater can be so readily or easily repaired, should repairs become necessary. Our Heater coils are arranged horizontally in such a manner that the breaking or straining of pipe, headers or fittings by expansion or contraction is entirely overcome (see cut on page 7) and still the heater is self-draining, and is less liable to freeze up in extreme cold weather than any other form of construction, and it is the only Hot Blast Heater made at the present time in which ALL the STEAM that enters the Heater MUST PASS THROUGH the heater pipes before reaching the drip or waste pipe; thus, no steam or heat is wasted, as all of the condensation even, runs ahead of the steam, and the latent heat contained therein is utilized; moreover, any well posted steam fitter or caloric engineer will bear us out in the statement that, all conditions being equal, horizontal steam pipes will deliver more heat units than vertical ones. Summing up all points for or against our apparatus, as compared with others in the market, it will be found that the Smith takes the lead over all others.

The Engines are made direct connected to the Heater fan, mounted on the same base with the fan and Heater, or are furnished detached driving with belt to fan pulley. These engines are strong, durable, and economical in the consumption of steam, and are constructed with the view of their receiving only indifferent care when in operation, and that they must run continuously 144 hours every week, and meet the requirements demanded of a hard worked engine. They are shipped complete with governor, governor belt, sight feed lubricators, oilers, wrenches, etc. They occupy as little floor space for their horse-power as any engine made.

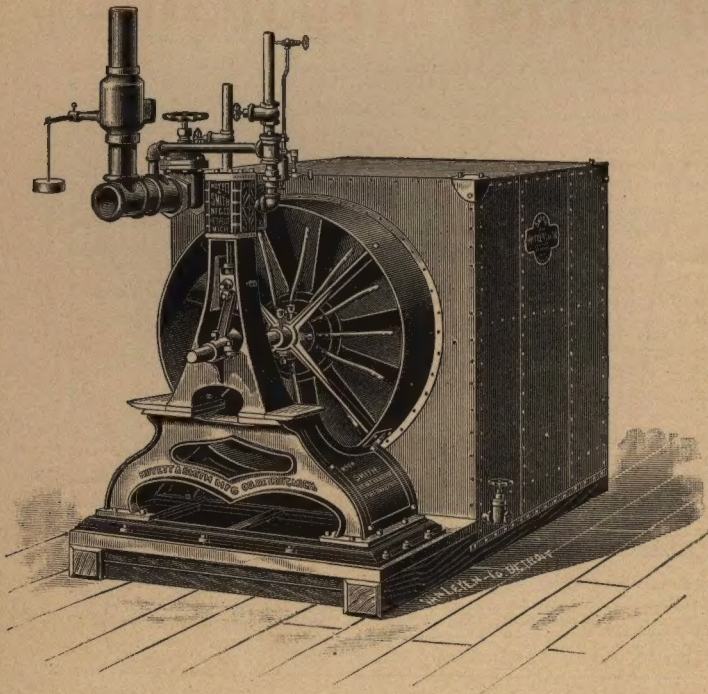




THE above cut represents the manner in which each coil of pipe, in our Smith Hot Blast Steam Heaters, is constructed and put together, each coil being connected with the top and bottom headers, by right and left hand threaded pipe. This arrangement allows any one coil to be removed from heater, without disturbing the remaining coils, therefore in no other style or construction of Steam Hot Blast Apparatus can repairs be made so readily, cheaply or effectively. The coils are held together lengthwise of the heater by steam pipe stays with flange nuts, screwed on ends, (letter A in cut). The coils are held in position vertically by flat bar iron side stays loosely bolted together at intervals (letter B in cut). Letter D represents T iron base support for bottom row of pipe, and side stays B. Letter C gives a sectional view of the manner in which we construct our return bends, the case (C) containing twice the area of the steam pipe which connects with the return bend, therefore (practically) no more resistance is offered to the free passage of the steam through the coil, than would be through straight pipe. These return bends are extra hefty and thickness, and are provided with wide flat bearing surface at top and bottom, so that one rests on top of the other in a free and unobstructed manner. Whereas, each coil is separate, only connecting at top and bottom headers, held in position by loosely bolted flat iron side stays (B), the whole held together lengthwise by round pipe stays (A), it stands to reason that these coils have more freedom to expand and contract, and with less strain on the joints, pipe and bends, than would be possible with any other form of construction, and the drainage is perfect as the fall, or pitch of the pipe is $1\frac{1}{4}$ inches in four feet.

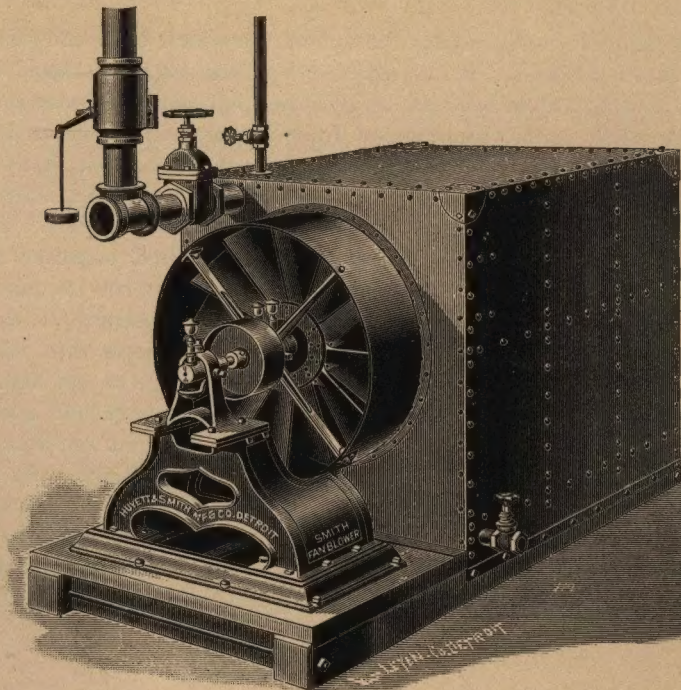
Smith Hot Blast Apparatus.

PATENTED.



THIS CUT illustrates the Smith Hot Blast Heater with direct attached engine for driving fan, the exhaust of engine being connected to main exhaust steam header of Heater.

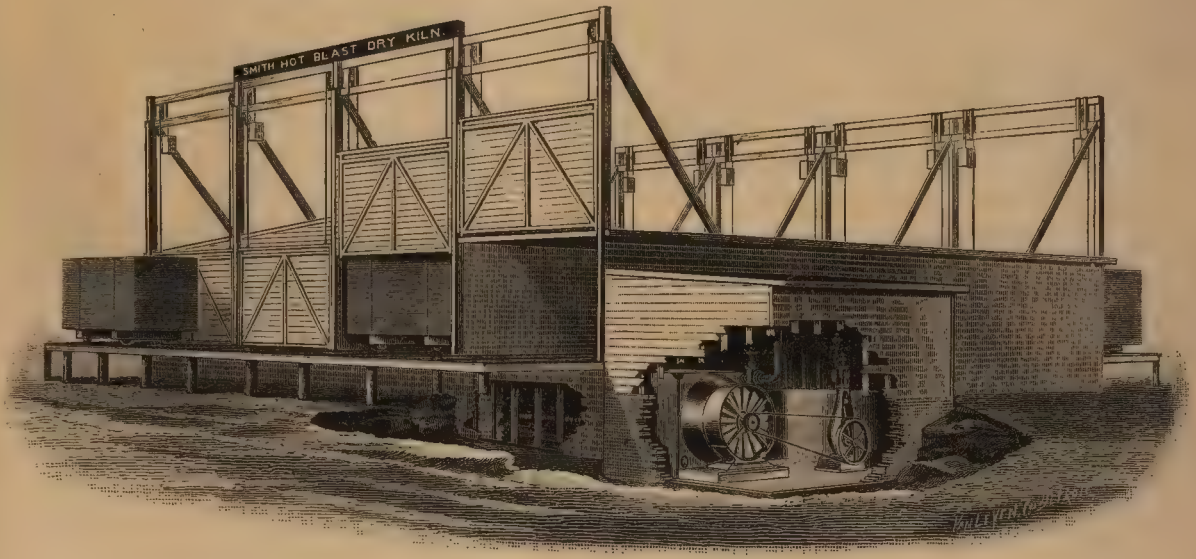
THIS CUT illustrates the Smith Hot Blast Heater without engine attached, and with outside standard bearing attached in place of engine, and with pulley between bearings, ready to receive belt.



— THE SMITH —

• Steam Hot Blast Apparatus •

AS APPLIED TO PROGRESSIVE LUMBER DRY KILNS.



BUILDING.

THE ABOVE CUT shows one of our four compartment Standard Progressive Lumber Dry Kilns, each Kiln being 17 ft. wide, 8 ft. high and 60 ft. long, with a 10-ft. platform at each end for loading and unloading cars.

The foundation can be either stone, brick, piles or cedar posts, on which are laid the sills. The walls and partitions are usually built of 2-in. x 6-in. studding, sheathed inside and outside with $\frac{7}{8}$ -in. matched stuff. Building paper is tacked onto outside of studs before putting on outside sheathing, and is tacked onto both sides of studs forming partitions. The ceiling is $\frac{7}{8}$ -in. matched stuff, nailed to 2-in. x 6-in. ceiling joists, on which is first tacked building paper. The roof is constructed of 2-in. x 6-in. rafters, covered with $\frac{7}{8}$ -in. boards; roofing felt is laid over these boards, and the whole covered with tar and gravel or sheet iron. The floors are of two thicknesses of $\frac{7}{8}$ -in. boards, with building paper between. Floors are nailed to sills under partitions and walls, also to sills under rails, as there are no joists.

The whole building is built with a declining pitch of one inch in six feet toward the heater end. This is to facilitate the movement of the kiln cars, as all green material enters the kilns at opposite end from heater, and comes out dry at heater end.

A SMALL ROOM is built adjacent to dry kilns, in which is located heater. From end of heater a duct extends under all the kilns with openings in the top, through which the air is forced into kilns. Trap doors are provided to deflect the current of air, or close off the air entirely. Main doors slide up and are counter-balanced by weights suspended on $\frac{3}{8}$ -in. steel wire rope running over cast iron sheaves, supported by the door-guide frame work.

We furnish free to customers complete plans and details, with specifications for constructing kilns. If customers wish to apply our system to a building already erected, we will make plans for same upon receipt of sketches and information.

The fixtures required for the building herein described consists of the following articles, all of which we furnish with a complete dry kiln outfit; viz: One Hot Blast Apparatus; one Direct Attached or Detached Vertical Engine; a complete set of Kiln Car Bunks, with which is an extra car for each kiln, so one car can be loading while the kiln is full; the necessary Tee Rail and Spikes for kilns and platforms; all the Steel Wire Rope required to suspend weight boxes and doors; all the cast iron Sheaves and Sheave Pins over which wire rope runs; all the Door Loops and Weight-box Loops, to which wire rope is fastened and a complete set of Canvas Curtains. Transfer Cars and Steam Trap extra.

ADVANTAGES OF BLOWER DRY KILNS OVER ALL OTHERS.

AMONG THE REASONS why Hot Blast Dry Kilns are superior to any other kind, may be mentioned the following: They dry lumber rapidly and evenly, without damage by season checking.

Lumber dries more rapidly with a lower temperature, than with any other dryer operated without a fan.

The least expense is incurred in handling lumber to and from the kiln in drying it.

The kilns can be built on ground level and thereby avoid elevating lumber when loading.

The Heater and Fan may be located at kiln, or in the mill, or the heater at kiln and fan in mill, or in any other way most convenient.

The Fan used by us is of the ventilator wheel pattern, patented by us and guaranteed to deliver four times as much air through heater to kiln as can be delivered by the "Shavings Exhaust" style of fan, with the same power.

The heated air after passing through kiln can be piped to mill or factory for heating purposes in cold weather.

A portion of the heated air can be returned and passed through the heater twice, thereby saving considerable heat, increase the temperature and add to the humidity of the air.

No fire can result from using our apparatus ; cannot be frozen up in coldest weather if drip cock is left open, and when once in operation requires very little care.

Different grades and kinds of lumber require different treatments. With our apparatus a high or low temperature can be maintained, also any velocity of the air desired. This is a great feature in drying and meets the requirements in every case.

Hot Blast Apparatus may be applied with great success in ordinary kilns where steam pipes are placed in the bottom. With this arrangement a small heater with large fan will do the work, and experience has shown that it increases the capacity from 20 to 60 per cent.

Our Apparatus is specially constructed for using exhaust steam from the main engine, but live steam may be used, or both live and exhaust steam together. The exhaust steam from Fan Engine may also be utilized in heater. By using exhaust steam in heater the cost of drying is reduced to a minimum.

WHY

The Smith Dry Kiln Hot Blast Apparatus

IS SUPERIOR TO ALL OTHERS.

THE SMITH DRY KILN HOT BLAST HEATER is *the only one made* so that *all* the steam taken into it *must* pass through the heater pipes, thus *no steam or heat is wasted*, as all the condensation, *even*, runs ahead of the steam, and the latent heat contained therein is utilized. Not so with heaters constructed with *cast iron base sections* and *perpendicular heater pipes*; these base sections are constructed with a partition in the interior of the section, with two rows of pipes entering, *one on each side* of the partition; the steam enters at *one side* of these base sections, and is *supposed* (by the uninitiated) to pass *up* one row of pipes and *down* the other over to the opposite side of partition in header, and thence to the waste pipe, but the water and condensation *will not flow up hill* in the first row of pipes in *each base section*, therefore they are each provided with an opening in the partition of the base, to let the water and condensation flow through and *out* to the waste pipe. Therefore *each base section* contains a *large opening* in its interior partition, which allows the steam to *WASTE direct through the base* to the waste pipe, and is thus a

dead loss. This waste of steam is most discernable and voluminous when these heaters are being operated with exhaust steam, as it then blows through freely, and a fair estimate of this wasted steam in this construction of heater, when using exhaust steam, is at least *one-eighth* the entire volume. When live steam is used the waste is not so great, as the steam trap checks the flow. The SMITH Heater is made *entirely* of *wrought, cast, and malleable iron*, is *self-draining, anti-freezing*, and never springs a leak, as the pipes are so arranged that contraction and expansion does not affect the joints.

The SMITH IS THE ONLY Dry Kiln Hot Blast apparatus in which the Fan handles the *cold air, pushing it through the heater crosswise of the pipes*, instead of *drawing the air through*, as is the case with *all other Hot Blast apparatus*, in which the fan *agitates and cools* the air *after* it has been passed through the heater. Common sense will tell you that to agitate hot air *violently* will *cool it*; and nothing will agitate air *more violently* than an exhaust fan. Hot air at 175° temperature will lose 10° heat by being passed through an exhaust fan. Moreover, cold air heated *expands*; therefore in the SMITH Hot Blast Apparatus we also get the benefit of this expansion and *no loss* of heat by agitation.

Any one section of pipes in the Smith Heater can be taken out (if occasion requires) without disturbing the others.

THESE FACTS CANNOT be disproved, no matter how ingeniously our competitors may seek to cover them up.

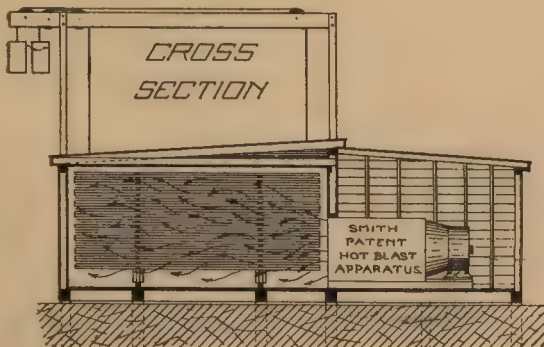
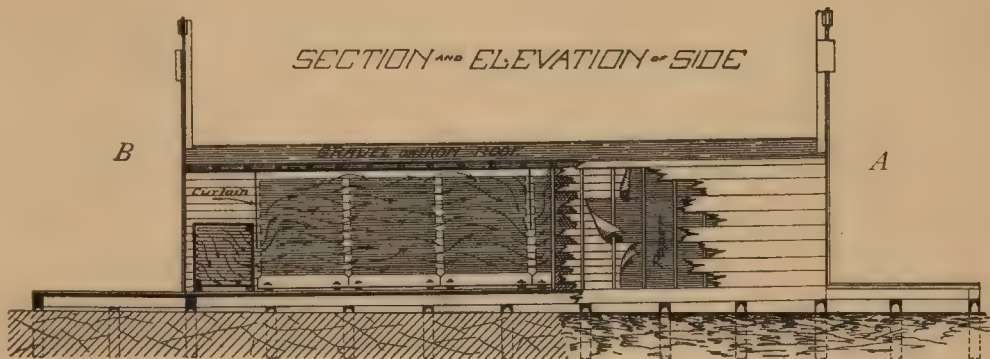
TIME REQUIRED TO DRY.—All kinds and thicknesses of lumber cannot be dried in the same length of time. Lumber one inch thick that has been exposed for three months and longer, can be seasoned in from 24 to 72 hours, while green lumber direct from the saw requires from three to six days and sometimes longer.

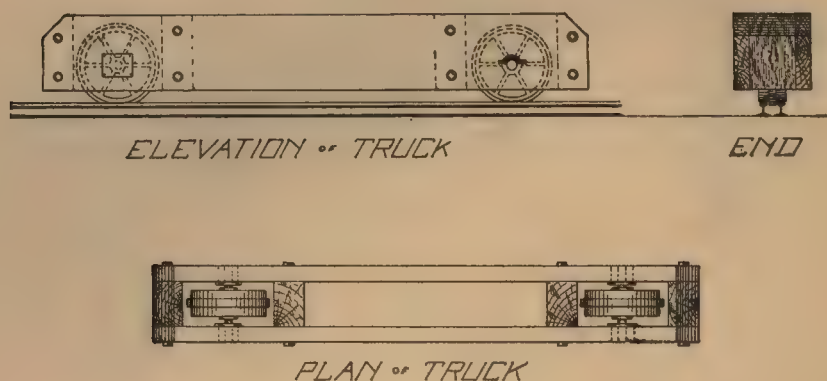
COST.—This method of drying not only achieves the best results, but combines cheapness of first cost with low running expense. The Apparatus is compact and solid, and is as essential to any well regulated wood-working shop as any machine contained therein.

The first cost of our Hot Blast Dry Kiln Apparatus and Fixtures may be slightly more than that of inferior kiln apparatus, but when put in operation its enormous saving qualities become at once apparent.



PLAN OF SINGLE KILN.





THE cuts on page 13 represent plan, end elevation, longitudinal and cross section of a one compartment Progressive Lumber Dry Kiln 42 ft. long, 17 ft. wide and 8 ft. high. Each car holds about 3,000 ft. of lumber and Kiln holds about 22,000 feet. The drying capacity of this Kiln is from 3,000 to 6,000 feet every twenty-four hours. The Heater is constructed as hereinbefore described and will deliver 15,000 cubic feet of air per minute at any temperature reasonably required.

Complete plans and details are furnished for building kilns and directions for operating same without extra charge.

The Lumber Trucks (see above cuts) furnished with Kiln outfit affords the cheapest and best method for moving lumber in and out of dry kilns. Two trucks make a car, except where lumber is longer than 16 ft., then three trucks to a car. We usually furnish the trucks or bunks made up ready for use, but we will furnish the iron work and drawings so purchaser can construct his own bunks if desirable. The iron work for each bunk consists of two wheels with steel axles, four sets of boxes, of two pieces each, and eight bolts with nuts and washers.

A special feature of our truck is the centre flange, which is a great improvement over the double flange wheel. With our center flange wheel two rails are required. This may seem like an unnecessary expense but when compared with the time wasted in trying to make two double flange wheels stand up on a single rail until a course of boards is piled on, one can readily see the advantage of the single flange wheel, which is self-supporting. We however, make and keep in stock the double flange wheels for single rail, and figure on same when requested to do so.

Brick Drying

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DRYING BRICK by the Hot Blast System is quite a departure from the old method of drying them in the open air; but it has been accomplished by us with the greatest success in all parts of the country and with various kinds of clay. In this generation competition is so great that a manufacturer can ill afford to wait for the slow process of air drying. In order to make a profit on his goods and meet competition he must adopt all the latest improvements and it is to economically facilitate brick manufacture that we offer this system of drying.

The best brick clays are composed of silica three-fifths, alumina one-fifth and the remaining fifth of iron, lime, magnesia, soda, potash and water. All of these elements are more or less in a plastic state, and must be thoroughly dried before burning to prevent warping, cracking and fusing. Bricks have a great absorbent quality, which can only be overcome by something having a greater absorbing power than they have, although vapor is present to a greater or less extent in any atmosphere, it is less in a high, than in a low temperature; this being the case, by increasing the temperature we also increase its capabilities to take up moisture. For instance: at 32 degrees a cubic foot of air will absorb or carry off two grains of water. At 70 degrees it will absorb eight grains, at 100 degrees it will absorb twenty grains, and at 200 degrees it will absorb or carry off two hundred and five grains. One can readily see from this wherein lies the success of our Hot Blast Apparatus, and how it is far superior to air drying both in effectiveness and rapidity.

Bricks made from good clay often become valueless after being air dried, from exposure to dampness and frost, as it has been found by experiment that disintegration due to frost equals a loss of substance of 74 parts in 10,000 for red and 24 parts for white brick. This alone though it appears small, destroys the resisting power, which is the principal factor in good bricks. With our apparatus this is impossible as the bricks are not exposed to the inclemency of the weather, being protected in tunnels and subjected to a very high temperature together with a rapid circulation of air.

All brick manufacturers using our Apparatus for drying have nothing but the highest praise to offer and it is with their approval as a basis that we assert ourselves as having the very best system of brick drying in use at the present time.

Those interested in this line will find it to their advantage to correspond with us.

HUYETT & SMITH MFG. CO.

Patentees and Sole Manufacturers,

DETROIT, MICH.

THE OPPOSITE CUT represents PLAN and Section of tunnels as arranged for DRYING BRICK when operated by the SMITH HOT BLAST APPARATUS. The plan represents five tunnels side by side, each 80 ft. long, 3 ft. 2 in. wide and 5 ft. high, with (brick car) tracks extending through and beyond each end of tunnels. Crossing these tracks at right angles are transfer car tracks for shifting brick cars to or from the various tunnels and kilns. The operation of tunnels is about as follows: As the green brick come from the brick machines they are piled directly on brick cars or on pallets (the latter is more preferable), leaving a sufficient *space* between bricks for the *free circulation* of hot air. When car is loaded it is run onto transfer car and shoved along to the tunnel it is to enter. This same process is continued until all the tunnels are filled.

The bricks nearest to heater end of tunnels will dry first and when they have dried sufficiently the doors at said ends should be opened, as many cars of brick run out as are dry enough to burn, and the remaining cars pushed forward to doors, which must be closed immediately after dry bricks are run out. The cars of dry bricks are then run onto transfer cars and shifted to kiln tracks.

As dry bricks are taken from tunnels, green ones are run in as above described, thus making the drying process continuous. The tunnel doors at the end where bricks enter are so constructed as to leave six inches from bottom of doors to top of tracks, to allow moist air to escape.

The tunnels are made and track laid with a pitch or fall toward Heater end of tunnels of *one inch in six feet*. This pitch or fall is sufficient to allow cars being moved with ease.

These tunnels are usually constructed of eight inch brick walls, covered over top with two inch plank placed close side by side, on these plank one inch boards, so placed as to cover joints, and the *whole* covered with from eight to ten inches of loose earth.

EXHAUST STEAM from your engine can be used to operate the Dry Kilns in day time, and live steam from boiler at night, or live steam all the time as may be desired. The above described plant will thoroughly dry 25,000 STIFF MUD BRICK EVERY 24 HOURS, and with *some clays* will dry more.

Figures 1 and 2 show our Improved Cast Iron Brick and Transfer Cars. These Cars embody all the latest improvements in their line which have suggested themselves to us during our long experience in brick drying. They are very simple and thorough throughout their construction, are provided with frictionless rolls for axle bearings, and with ordinary care will last a life-time. For general description and view of cars see page 18.

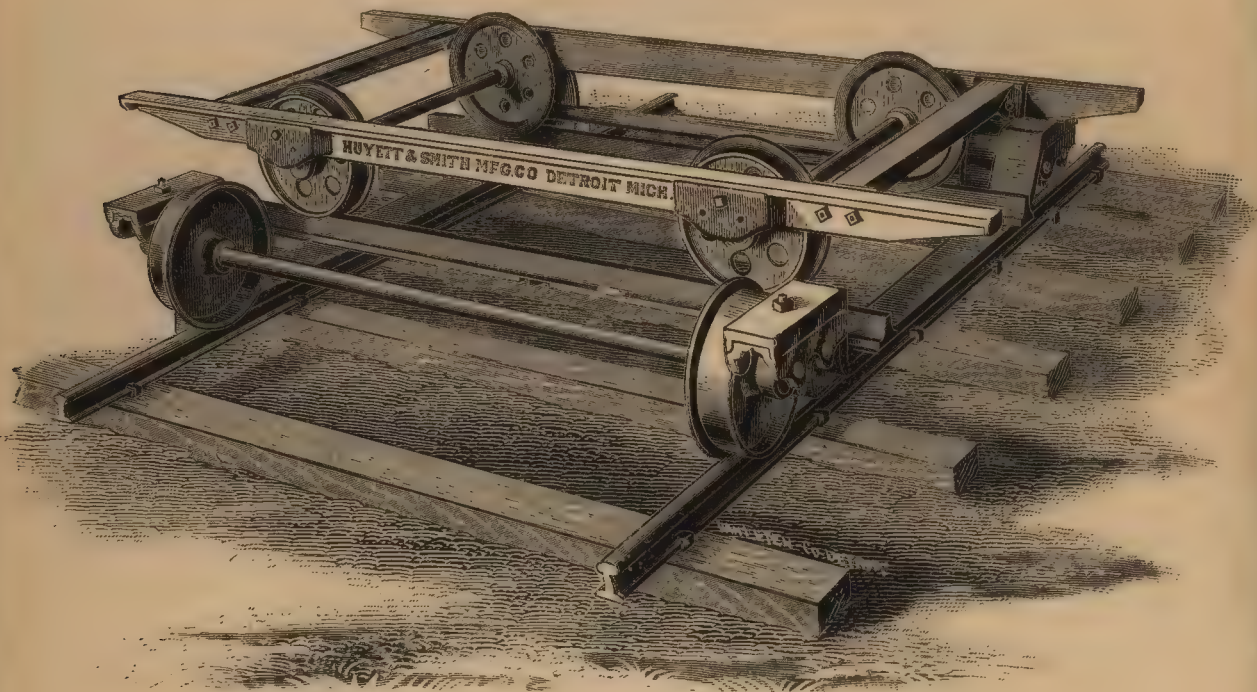
The opposite cut also shows plan, side and end elevations of brick pallets, on which bricks are piled when loaded on cars for drying. We furnish complete plans and specifications fully describing all details connected with placing and operating the entire apparatus with every invoice.

For further information address,

HUYETT & SMITH MANUFACTURING CO.,

DETROIT, MICH.

Improved Iron, Brick and Transfer Cars.



THE ABOVE CUT illustrates our improved cast iron brick and transfer cars. These cars are made of cast angle iron frames and cast iron wheels with wrought iron axles. Instead of journals for axle bearings, there are frictionless rolls. These rolls are extremely simple, light and durable in their construction, requiring no lubrication and by their use enables a boy to move a car load of 900 bricks easier than a man can wheel fifty with an ordinary wheel-barrow.

Bricks are piled on pallets, which rest on the flanges of the frame of cars. A sufficient space should be allowed between each brick for the free circulation of air all around them, and pallets should have slats instead of a solid back, for the same purpose.

Most transfer cars are so high that a deep pit has to be dug to get the top of them on a level with the grade, or else the car tracks have to be raised very high above the grade. Either of these objections are a great inconvenience but are entirely overcome by our cast iron transfer cars. The frames of these cars are lowered between the wheels just as far as possible without touching the track.

All the material and workmanship on every car is guaranteed first-class and we warrant them superior to any brick and transfer cars on the market.

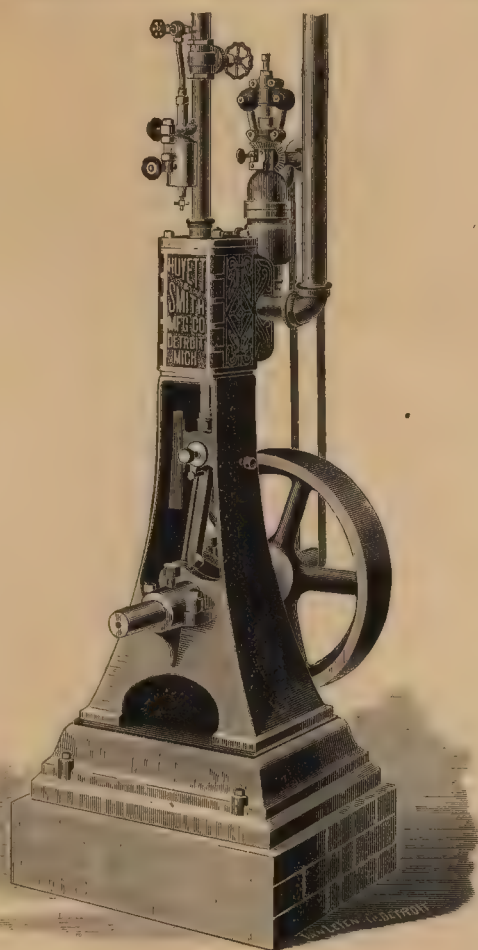
We also manufacture and keep in stock all the iron work required for brick and transfer cars having a wood frame body, and shall be pleased to answer all inquiries promptly and in detail regarding either.

Thuyett & Smith Mfg. Co.'s

New High Speed Engines.

WE PRESENT here an illustration of our Upright Engine as specially designed and manufactured by us for fan propulsion.

It must not be supposed that engines designed for running fans or blowers, are inferior to the general grade of factory engines, or that any engine will do the work. The fact is, they



must be superior in all points of strength and workmanship, at the same time, simple, and capable of running at a very high speed. They must be designed to run twenty-four hours every day and six days in the week, frequently in the midst of dust and dirt and in a place where the engineer can give them very little attention. It was with these facts thoroughly appreciated that led us to manufacture our own engines, and we feel confident in offering these to the public that they will last longer with hard usage than any other engine not specially designed for this class of work. The engine frame is one solid casting, journal boxes included. The cylinder and steam chest is in another solid casting and bolts firmly onto frame. The bottom of frame is so designed that it can be bolted onto the cast iron base, which forms a part of fan base when engine is attached direct to Fan Shaft, as shown by the illustration of heater on page 8, or it can be bolted to a cast-iron base designed for same when used as an Independent Engine for belt connection,

as shown above. By having the Boxes cast with the frame a rigid alignment is thus attained.

We keep in stock a constant supply of all sizes of Engines, which, for hard work, and good wearing qualities cannot be equaled.

Factory Heating.

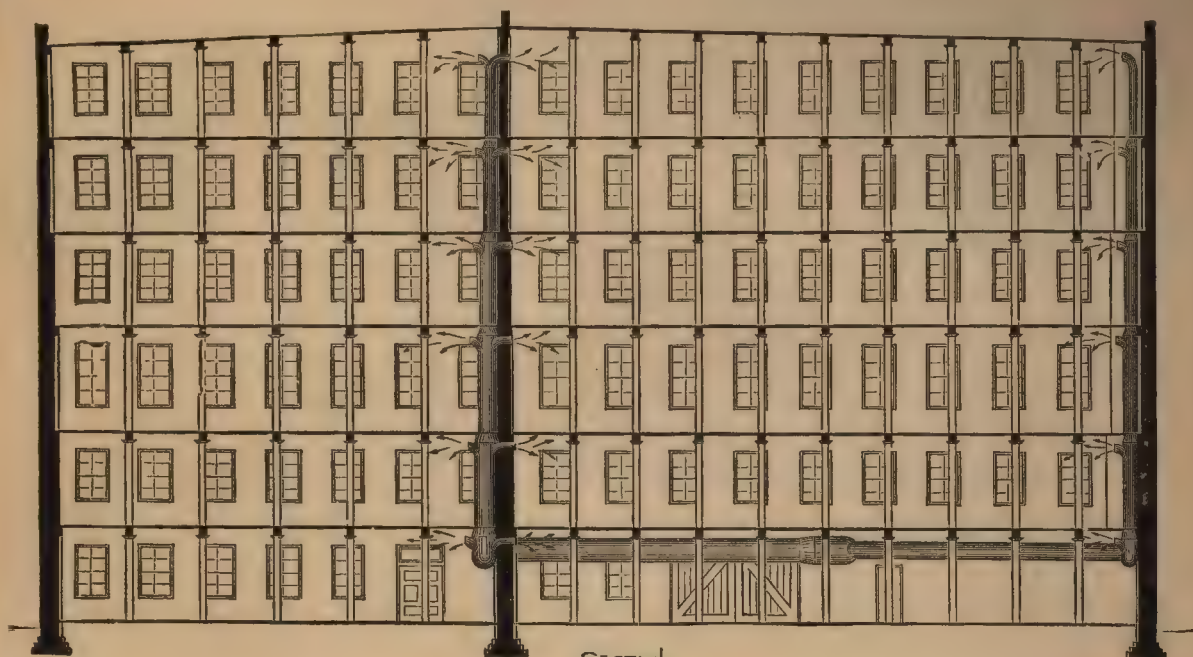
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THE ILLUSTRATIONS on the opposite page show ground plan and sectional view of a large factory building, heated with our hot blast system, the same heater being connected with a dry kiln. This arrangement is often desirable and is found economical and efficient. Our system is applicable for factories of ALL KINDS and possesses among others the following advantages.

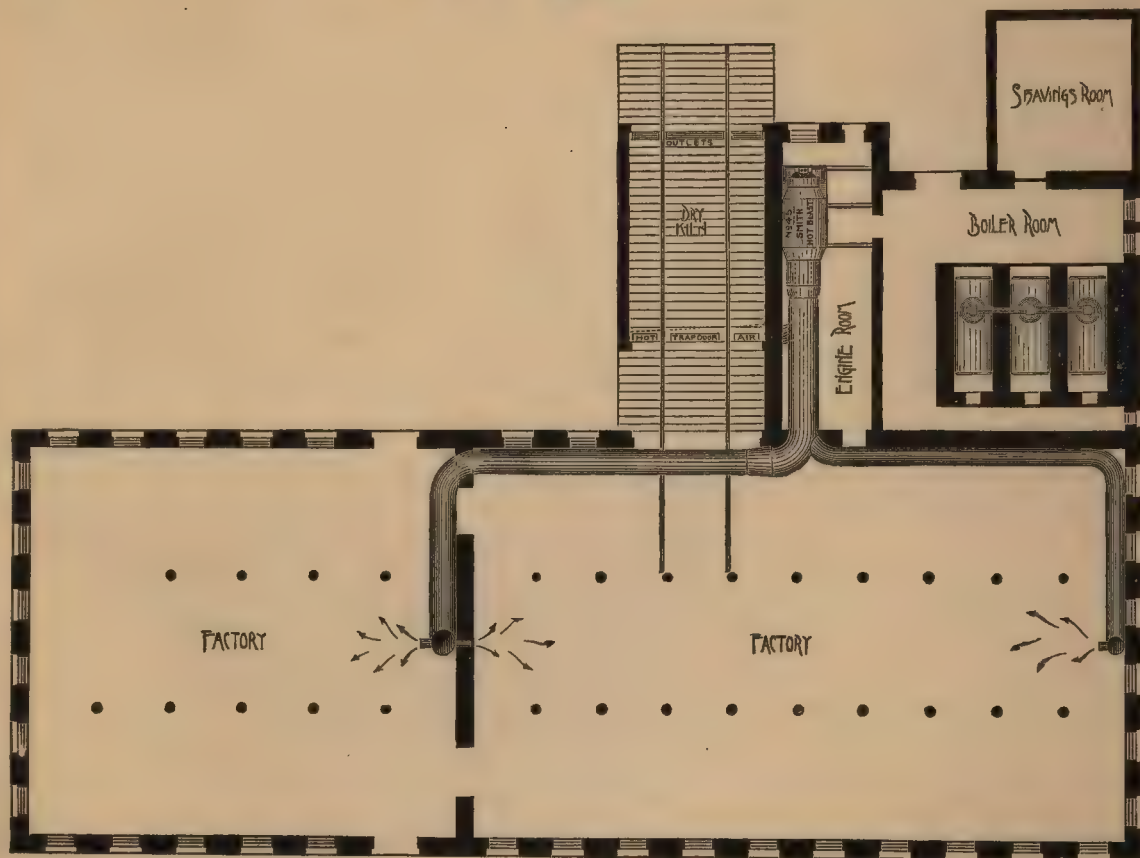
ECONOMY.—Use of exhaust steam in heating, and small amount of power required to drive fan as fully set forth on another page; also, avoidance of the necessity of repairs and steam pipes located throughout the building, as is the case with direct steam heating.

VENTILATION.—By the use of our system a constant change of air is obtained throughout the entire building, necessarily rendering the air pure and free from disagreeable and unwholesome odors produced in many kinds of manufacturing, and thereby enabling the operatives to do more and better work as well as preserving their health.



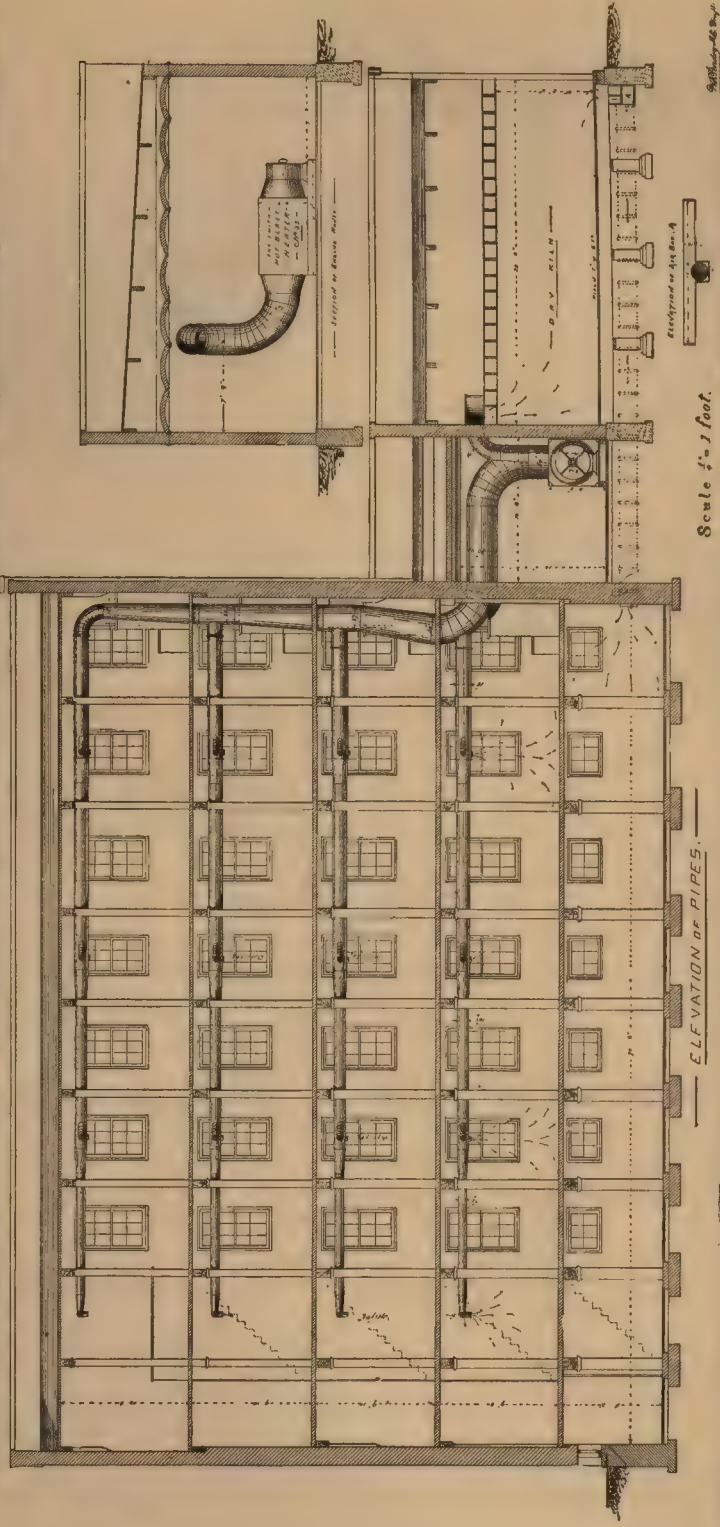


SECTION.

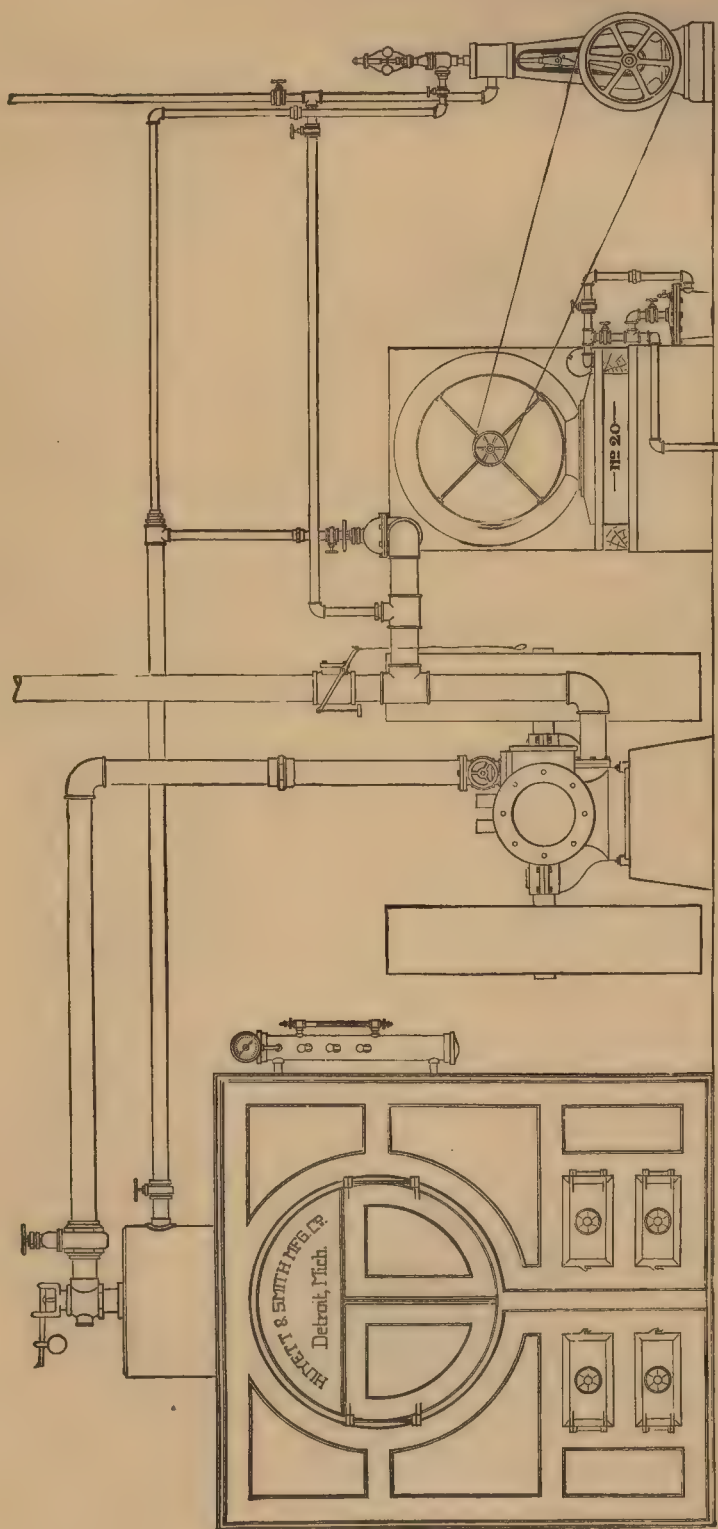


FIRST FLOOR PLAN.

SMITH HOT BLAST DRY KILN, AND FACTORY STEAM HEATING APPARATUS MADE BY HUYETT & SMITH MFG. CO., DETROIT, MICH.



SECTIONAL ELEVATION of factory and dry kiln, showing how both factory and dry kiln can be operated from one apparatus. We have fitted out hundreds of factories in this way, and to the entire satisfaction and delight of the owners. Write us for testimonial circular of users.



THE ABOVE CUT shows the general principal and plan of making both LIVE and EXHAUST steam connections between the factory boiler and engine, and the Smith Hot Blast Apparatus. Special plans furnished when desired.

School Heating and Ventilation.

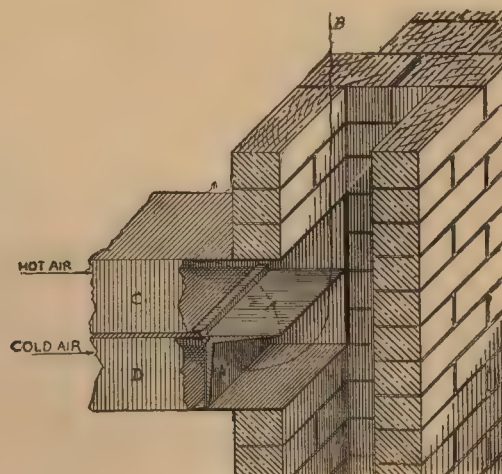
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THE CUTS on opposite page, show basement and first floor plan of a modern 14 room school building (two stories above basement) heated and ventilated throughout by the Smith Hot Blast system. The air conduit pipes leading from Heater to the various brick ducts in walls communicating with each room are made double, the top conduit pipe conveys the fresh warm air from Heater to the register ducts, and the lower pipe conveys cold air direct from fan, which passes beneath the Heater (see page 29) and through these lower conduit pipes direct to the SAME REGISTER ducts in walls that the hot air pipes are connected with, see cut bottom of page 25, both being connected to a switch box placed in the wall at base of register duct, see cut at bottom of this page. This switch box is arranged with an angle valve which is operated by a pull wire from the school-room, so that the teacher or janitor can close off the warm air partially or entirely, and in proportion as the warm air is shut off the cold air duct is opened, or vice versa, as the temperature of the room may require.

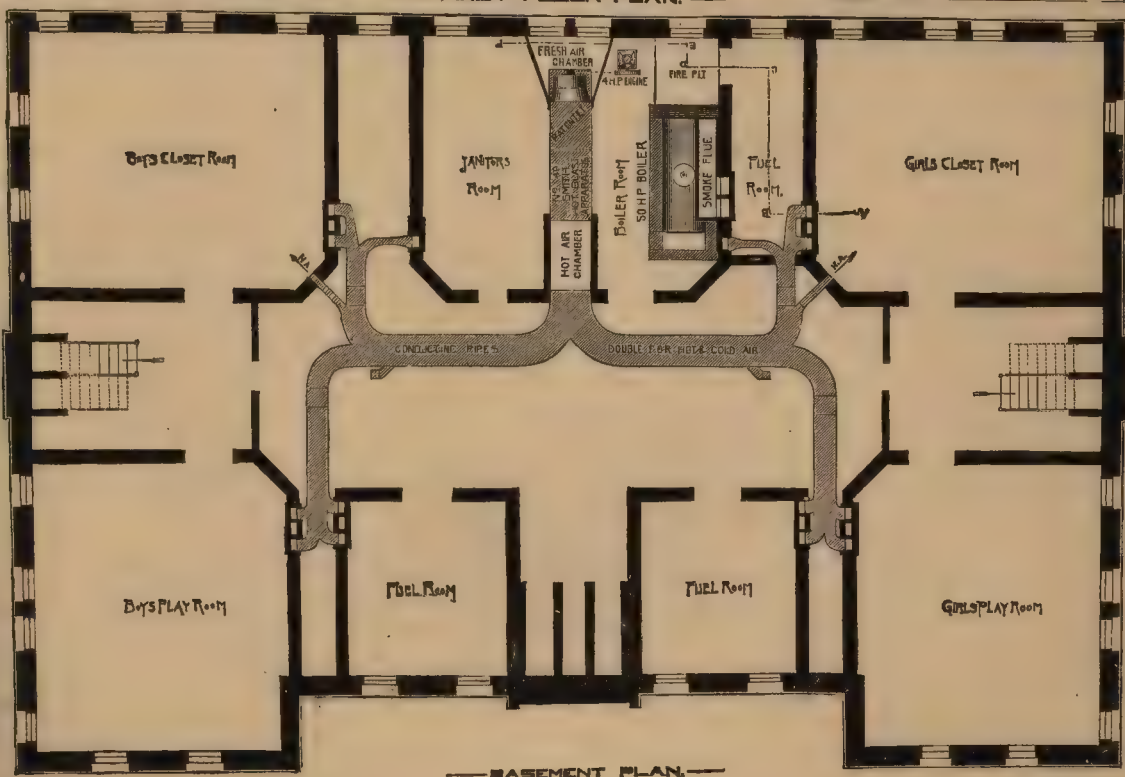
The fan carries an equal pressure on both the hot and cold air ducts, so that no matter which way the switch box valve may be placed, the same quantity of fresh air, either hot or cold, is constantly being supplied to the room. This system cannot be employed successfully in connection with any other apparatus, it being necessary to force the air through the Heater in order to obtain these results.

This system of heating and ventilating is known as the Smith Indirect Steam Fan Blast system, and for health, cleanliness, convenience, economy, durability and positive results obtained under any and all conditions of weather or temperature, it has no equal.

We contract for putting in plants of this description either entire, or for the apparatus only.



SWITCH BOX.



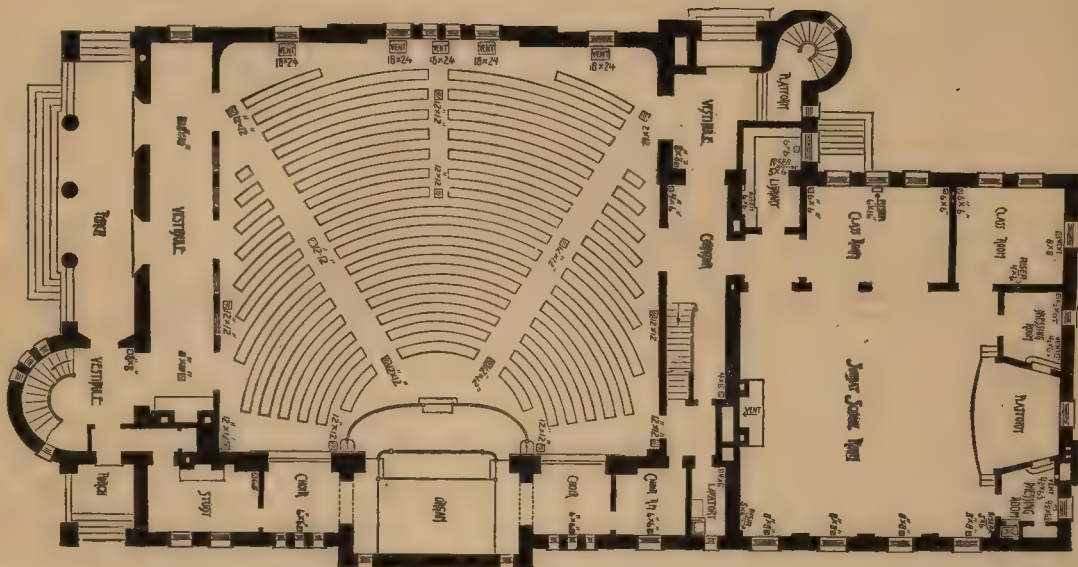
Church Heating and Ventilation.

• • •

THE CUTS on opposite page show basement, and auditorium, floor plan of a church edifice, as heated and ventilated by the Smith Hot Blast Apparatus. The hot air ducts leading from the apparatus to the auditorium and various rooms to be heated, discharge the warm fresh air through registers placed in floor or the base beneath the pews, or wherever most practical or convenient, according to the arrangement of the interior of the building, and the foul air is forced out through large foul air registers usually placed in the floor at rear of auditorium, and in the base of partitions or walls in the small rooms, these foul air ducts either leading to the attic or to basement, and connecting with a main duct which is so arranged that the foul air can be discharged outside, or returned to the fan, as occasion may require.

It is of importance when heating up church edifices before the congregation arrives, to return all the air to fan of Heater, thereby re-circulating the air and saving heat and fuel until the audience arrives ; then turn the foul air outside, and open fresh air duct and allow the fan to receive its air supply from outside the building. This system is the most healthful, pleasant, positive, perfect and economical system of heating and ventilating CHURCHES, THEATRES, and AUDITORIUM BUILDINGS of all kinds.





—First Floor Plan—



—Basement Plan—

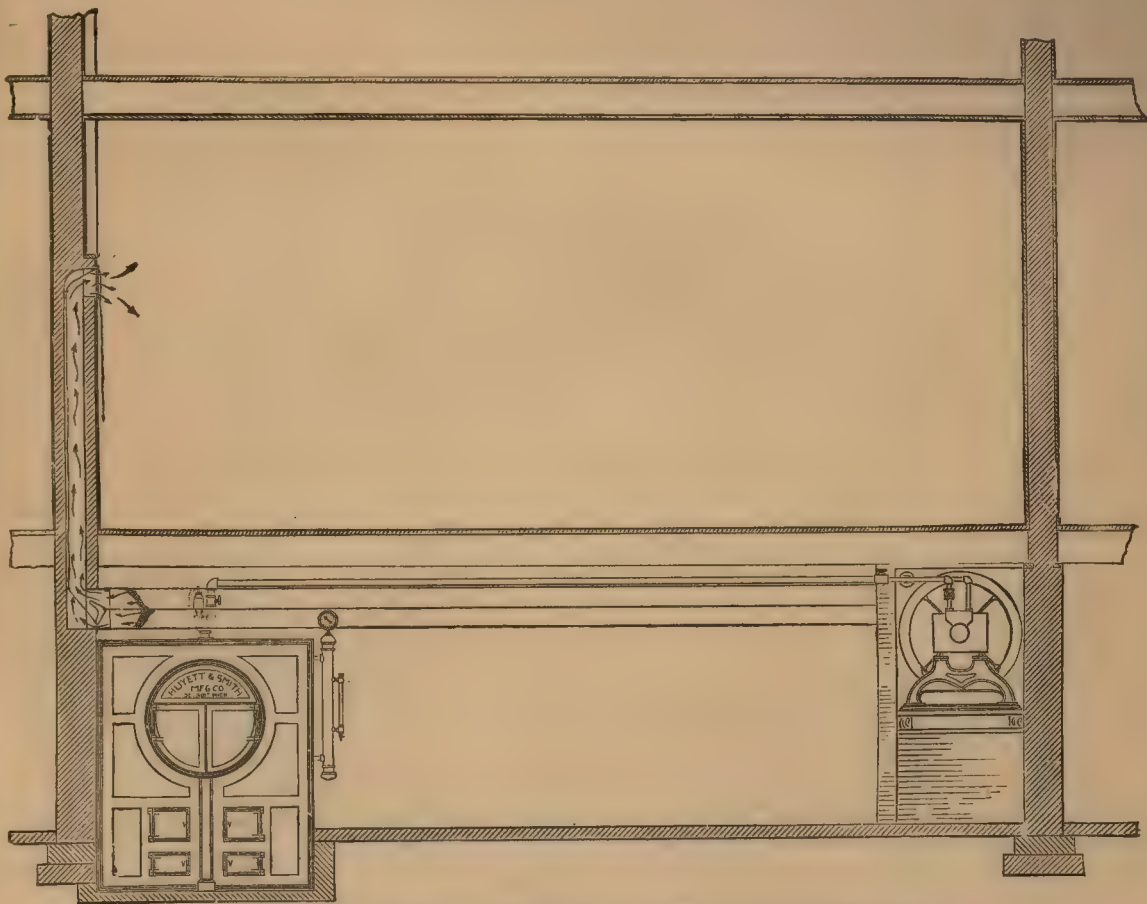
Setting Boiler and Heater.

. . .

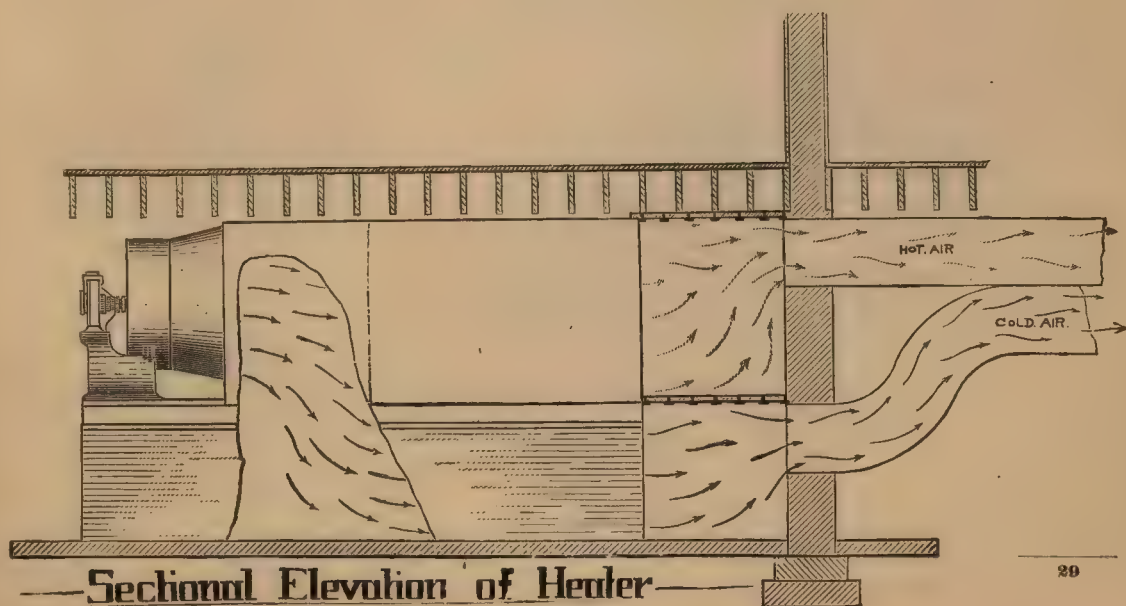
THE UPPER CUT on opposite page illustrates how a Smith Hot Blast Heater may be placed so that the bottom of Heater is 8 to 24 inches above high water line in boiler, which allows the condensation from Heater to be returned to the boiler by gravity, thereby dispensing with tanks, pumps, steam traps, etc. Where this plan is adopted on a very slight fall from Heater to boiler, the Steam Supply pipe between boiler and Heater should be the full size of the top header of Heater, but where the bottom of Heater is placed six or more feet above high water line in the boiler, the steam supply pipe can be one-half less in size.

THE LOWER CUT on opposite page of Heater and air ducts illustrates how hot or cold air may be delivered to registers in buildings, alternately or together from the one fan attached to Heater. This plan is often desirable, especially so in connection with school heating and ventilation, or where a given quantity of air, either hot or cold, or both, must be maintained.





— Section Showing Boiler and Heater —



— Sectional Elevation of Heater —

Buildings

Heated and Ventilated by our System.

• • •

WE HERE PRESENT a few illustrations picked at random from hundreds in various parts of the country, showing the character of building for which the system is adapted.



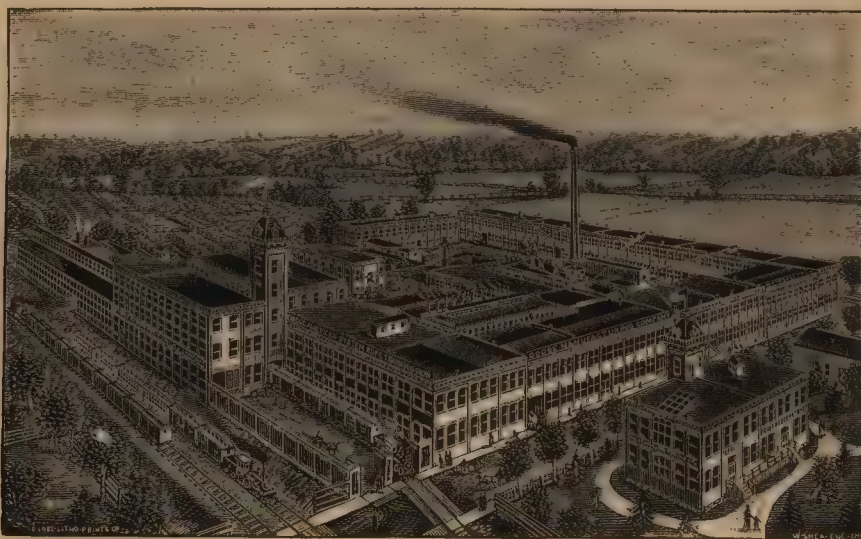
THE KNOWLES LOOM WORKS, WORCESTER, MASS.

THE MAIN BUILDING shown in above cut contains about 1,500,000 cubic feet of space. The hot air ducts are around court walls of buildings below basement floor, and built of brick and cement. Risers from these ducts are carried up in the walls, of such sizes as will furnish an abundance of air to thoroughly heat and ventilate each floor and all their apartments. Fan will deliver from 90,000 to 120,000 cubic feet per minute.



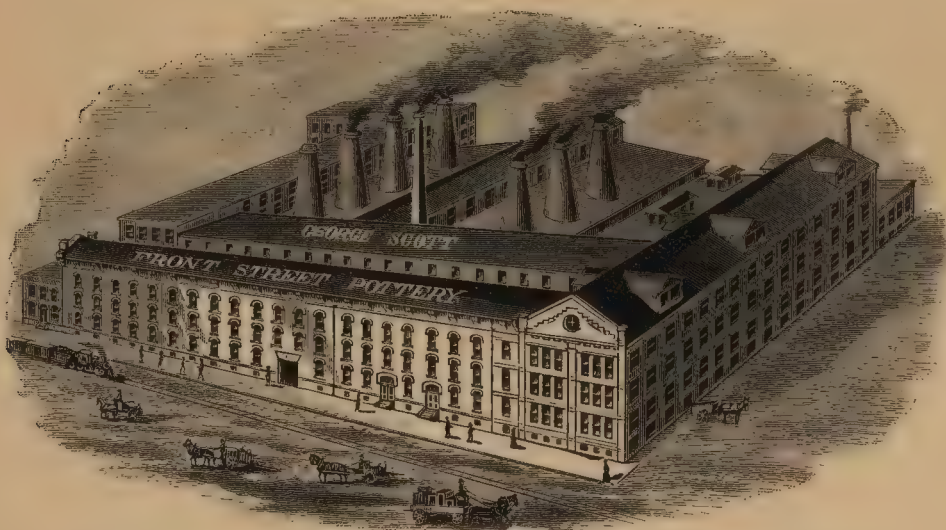
THE NEW MUNICIPAL COURT BUILDING, DETROIT.

THIS BUILDING contains 279,000 cubic feet of space, and is heated by the Smith Patent Hot Blast Apparatus. Fan attached to apparatus is 42 inches in diameter and will deliver 20,000 cubic feet of air per minute at a temperature ranging from 200 degrees to 300 degrees Fahrenheit.



THE DODGE MANUFACTURING COMPANY, MISHAWAKA, IND.

THE LARGEST manufacturers of Wood Split Pulleys in the United States. Building heated entirely by our system.



GEO. SCOTT'S SONS, POTTERY, FRONT STREET, CINCINNATI, OHIO.

Factory heated and Dry Kilns operated by the Smith Hot Blast Heating Apparatus.



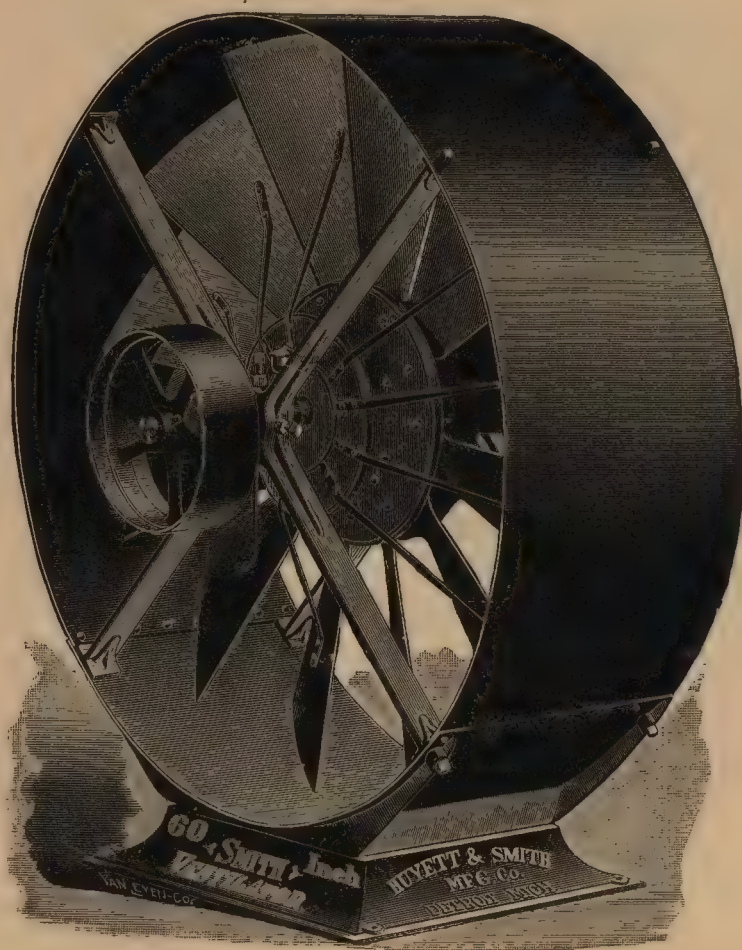
THE DOUGLAS SCHOOL, CHICAGO, ILL.

THE ABOVE ILLUSTRATION shows one of the largest, if not the largest, handsomest, and best equipped Public School buildings in existence, an important feature of which is the system of ventilation designed and put in by the Huyett & Smith Mfg. Co.

Smith Ventilator and Drying Fan

..... FOR

Paper Mills, Woolen Mills, Chemical Laboratories, Malt Houses, Tobacco
Factories, Foundries, Public Buildings, Restaurants, Laundries,
Stores, and for use in all places where a constant change
of air is required for Drying, Cooling,
Ventilating, Etc.



THE SMITH FAN is the only one made with a solid base, but is furnished with flanges for bolting to casing when circumstances require it, there being no difference in price.

Price List

... OF THE ...

Smith Ventilator Fans.

SIZES.	18 Inches.	21 Inches.	24 Inches.	30 Inches.	34 Inches.	36 Inches.	42 Inches.
Diameter and Face of Pulley	4 x 3½	5 x 3½	6 x 4½	8 x 4½	10 x 4½	10 x 4½	12 x 5½
Size of Base	13½ x 12	13½ x 12	20 x 16	19½ x 22	22 x 22	22 x 22	24 x 28
Height of Base	3½ inches.	3½ inches.	4½ inches.	5 inches.	5 inches.	5 inches.	5 inches.
Revolutions per minute	1,300 to 1,800	1,200 to 1,700	1,000 to 1,500	900 to 1,200	800 to 1,000	700 to 950	600 to 900
Capacity in cu. ft. of air per minute	6,000	8,000	10,000	15,000	20,000	25,000	30,000
Price	\$40	\$45	\$50	\$65	\$75	\$85	\$100
Weight	70 lbs.	80 lbs.	135 lbs.	175 lbs.	210 lbs.	250 lbs.	330 lbs.
H. P. required at Minimum Speed ..	.75	.95	1.30	1.55	1.75	2.00	2.25

SIZES.	48 Inches.	54 Inches.	60 Inches.	72 Inches.	84 Inches.	96 Inches.
Diameter and Face of Pulley	18 x 5½	14 x 6½	16 x 6½	18 x 7½	20 x 7½	24 x 7½
Size of Base	24 x 28	28 x 38	28 x 38	28 x 38	No Base.	No Base.
Height of Base	5 inches.	5 inches.	5 inches.	5½ inches.	No Base.	No Base.
Revolutions per Minute	500 to 500	450 to 750	350 to 500	300 to 450	250 to 400	225 to 350
Capacity in cu. ft. of air per minute ...	40,000	50,000	60,000	85,000	120,000	150,000
Price	\$125	\$160	\$200	\$250	\$375	\$450
Weight	430 lbs.	550 lbs.	660 lbs.	995 lbs.	1,260 lbs.	1,475 lbs.
H. P. required at Minimum Speed	2.75	3.50	4.25	5.25	6.75	8.50

THE ABOVE PRICES are subject to a discount to the trade which will be quoted on application.

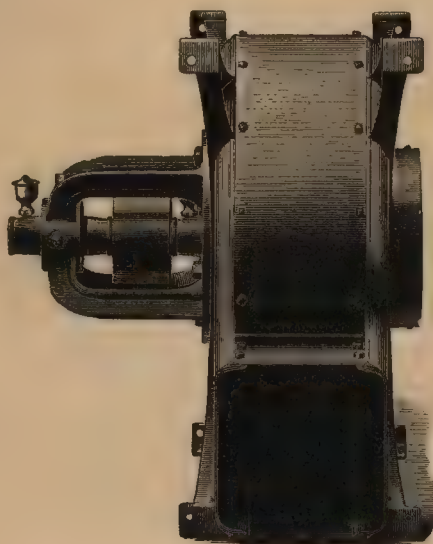
OUR VENTILATOR FAN as illustrated on opposite page, is made of the best material throughout. The blades are made of the best homogeneous steel, and all sizes larger than 36 inch are braced as shown in cut. The casing is of the best steel. All castings are our own make, and the shafting, journals, oilers, etc., are the best obtainable.

The general design and finish of this fan is beyond comparison. Our first consideration however, has been that of efficiency, and we will guarantee that with equal expenditure of power to operate it will deliver at least 25 per cent more air than any other fan. For **FINISH, DURABILITY AND EFFICIENCY**, the Smith Fan has no equal.

The Smith Dixie Exhaust Fan.

THIS FAN is designed for exhausting foul air, gases, etc., in places where the conditions render the use of the Ventilator type difficult or impossible. It is ECONOMICAL, STRONG, SAFE, NOISELESS, and can be placed in any position.

Further particulars on application.



RIGHT HAND "DIXIE" EXHAUSTER.
Bottom Horizontal Discharge.

Price List Single Wheel, Single Inlet Fans.

No.	PRICE.	Diameter of Inlet.	Outlet.	No. of Square Inches Inlet.	No. of Square Inches Outlet	Diameter of Blast Wheel.	Diameter of Pulley.	Face of Pulley.	Revolutions per Minute.	Weight, Lbs.
14	\$ 60 00	9 inches.	7½ x 8½ in.	63	64	14 inches.	4½ inch.	5½ inch.	2,500 to 2,800	175
18	80 00	11 "	9½ x 10½ "	95	100	18 "	6 "	8½ "	2,000 to 2,400	250
22	100 00	13 "	11½ x 12½ "	132	144	22 "	7 "	10½ "	1,800 to 2,200	375
26	140 00	15 "	13½ x 14½ "	176	195	26 "	8 "	12½ "	1,400 to 1,600	500
30	180 00	17 "	15½ x 16½ "	226	255	30 "	10 "	15½ "	1,200 to 1,400	750
34	240 00	19 "	17½ x 18½ "	284	324	34 "	11 "	18½ "	1,050 to 1,200	1,100
42	320 00	24 "	21½ x 22½ "	452	484	42 "	14 "	22½ "	950 to 1,050	1,500

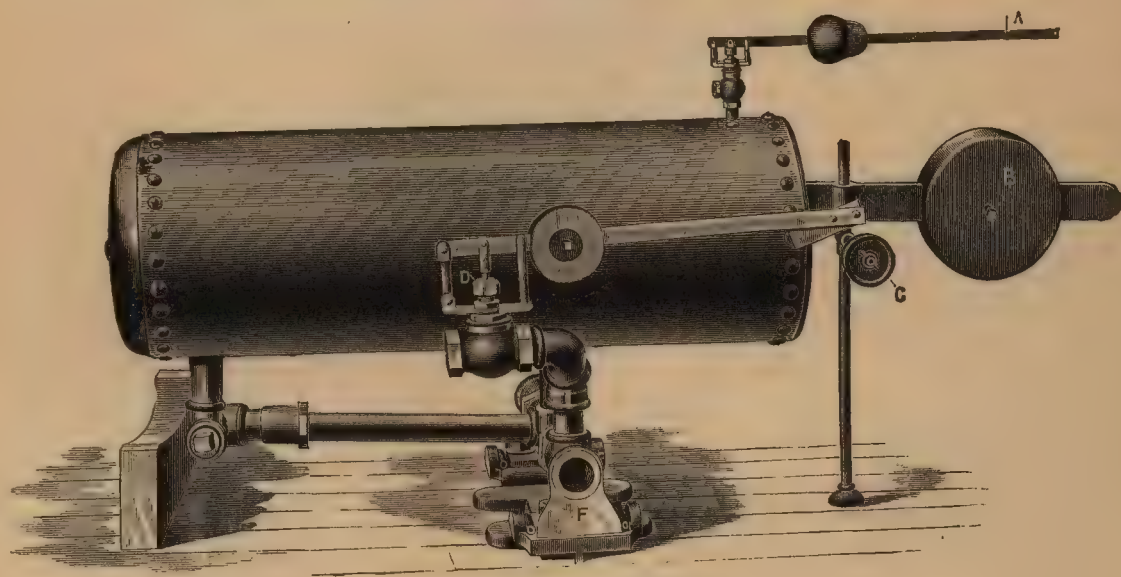
Price List of Smith "Dixie" Exhaust Fans (Double), on Cars at Detroit, Mich.

No.	PRICE.	Diameter of Inlet.	Outlet.	No. of Square Inches Inlet.	No. of Square Inches Outlet	Diameter of Blast Wheel.	Diameter of Pulley.	Face of Pulley.	Revolutions per Minute.	Weight, Lbs.
14	\$ 90 00	9 inches.	7½ x 8½ in.	126	128	14 inches.	4½ inch.	5½ inch.	2,500 to 2,800	350
18	120 00	11 "	9½ x 10½ "	190	200	18 "	6 "	8½ "	2,000 to 2,400	500
22	160 00	13 "	11½ x 12½ "	264	288	22 "	7 "	10½ "	1,800 to 2,200	700
26	230 00	15 "	13½ x 14½ "	352	390	26 "	8 "	12½ "	1,400 to 1,600	900
30	280 00	17 "	15½ x 16½ "	452	510	30 "	10 "	15½ "	1,200 to 1,400	1,400
34	420 00	19 "	17½ x 18½ "	568	648	37 "	11 "	18½ "	1,050 to 1,200	2,000
42	550 00	24 "	21½ x 22½ "	904	968	42 "	14 "	22½ "	950 to 1,050	2,750

Morehead Patent Automatic Steam Trap,

FOR RETURNING CONDENSATION TO BOILERS.

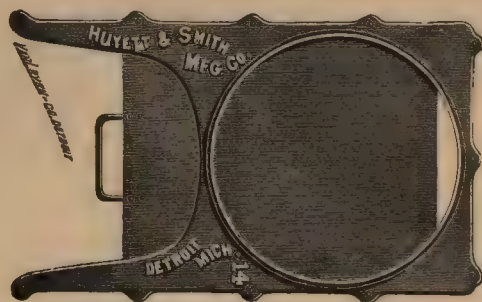
The only thoroughly efficient, reliable and durable Return Trap made. Find below a brief description of it, and write for full particulars and prices.



THE object of this trap is to return the water of condensation from steam coils and steam-using machinery direct to the boiler, for which purpose it is located above the water level. It consists, as shown in the engraving, of a tank so supported as to be free to tilt upon a bearing between the two check valves, the nearer of which is marked F in the cut. The open end of the valve D is connected with the steam dome of the boiler, the water of condensation, returning through the check valve F, enters the tank; and when a sufficient accumulation has taken place to overcome the effect of the weight B, the trap will tilt until the left-hand end is received in the hollow block below. In a socket in the arm carrying the weight B is secured, by a set screw, a standard upon which is a roller C. When the trap tilts this roller is brought against the end of the lever of the valve D, raising the valve and admitting steam from the boiler to the interior of the trap. The pressure thus being the same upon the surface of the water as that in the boiler, the water descends by its own gravity, entering the boiler through the check valve opposite F. When the trap is emptied the weight B returns it again to the position shown in engraving, in which it is supported by the standard carrying the roller C. The valve lever A is attached to a rod which engages with the base, so that when the trap is in the position shown, the valve connected with that lever will be open, relieving any pressure inside the trap. When, however, the trap tilts again, this valve is seated by the weight upon the lever. It is extremely simple in its operation and construction, has no float, and the only valves are upon the outside, free from any corrosive action, and are always under inspection.

SMITH BLAST GATES.

For Opening and Closing Pipes which Supply Blast Furnaces, Forges, Etc.



PRICE LIST.



	Each.		Each.
2 inch.....	\$1.05	15 inch.....	\$ 8.00
2½ "	1.10	16 "	9.00
3 "	1.20	17 "	10.00
4 "	1.30	18 "	11.50
5 "	1.80	19 "	13.00
6 "	2.00	20 "	14.50
7 "	2.60	21 "	16.00
8 "	3.00	22 "	17.00
9 "	3.50	23 "	18.00
10 "	4.10	24 "	19.00
11 "	4.75	26 "	21.00
12 "	5.25	28 "	23.00
13 "	6.00	30 "	25.00
14 "	7.00		

These Measurements Apply to the outside of the Collars of the Blast Gates.



MANUFACTURED BY THE

HUYETT & SMITH MFG. CO.,

DETROIT, MICH.

The Huyett & Smith Mfg. Co.

ALSO MANUFACTURE THE CELEBRATED

❖ ❖ SMITH ❖ ❖

Exhaust Fans,

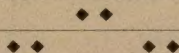
FOR REMOVING SHAVINGS AND DUST.

Shavings and Dust Arrestors,

Cupola Forge and Pressure Blowers,

Dixie Seed Cotton Elevator Fans.

ETC., ETC., ETC.



Catalogues and Circulars of the above will be furnished

on application.

